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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/068,959 | 02/11/2002 | Tomo Baba | 111945 | 2376 |

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

| EXAMINER | |
|---|---|
| LI, SHI K | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2633 | |

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/068,959 | BABA ET AL. | |
| | Examiner | Art Unit | |
| | Shi K. Li | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-22 and 24-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22 and 24-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 27 depends on claim 23. However, claim 23 has been cancelled.

### *Claim Rejections - 35 USC § 103*

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staiger (PCT Publication WO 98/39861) in view of Tanenbaum ("Computer Networks" by A. Tanenbaum, Prentice-Hall 1981, pp. 103-104) or Friend et al. ("Understanding Data Communication" by G. Friend et al., Texas Instruments Inc., 1984, pp. 4-8 through 4-13). In the following rejections, references to figures, line and col., are based on U.S. Patent 6,628,441 B1, which is an English equivalent of WO 98/39861.

Regarding claim 1, Staiger discloses in FIG. 5 a transmission system with a plurality of units. FIG. 5 comprises an optical signal transmission section for connecting the units as illustrated in FIG. 1 where optical bus 7 is an optical signal transmission section. Staiger teaches in col. 3, lines 35-38 that the subsystems can be any units communicating with one another, for example, processors, mobile telephones, TVs, navigation units, graphics units audio/video units

and remote control systems. That is, some of the units of FIG. 5 can be radio signal reception units such as mobile telephones or TVs and some of the units of FIG. 5 can be processors for processing signals received by the mobile telephones or TVs. Therefore, Staiger teaches a plurality of radio signal reception sections and a plurality of reception signal processing sections. The optical bus 7 optically transmits the received signal from the plurality of radio signal reception sections to the plurality of reception signal processing sections. Staiger teaches in FIG. 5 that several users share the same bus. For example, units A, B, and F can communicate with each other via the same sheathed bus. It may not clear from FIG. 5 that a unit can transmit to a plurality of units respectively. However, instant specification admits in page 20, last paragraph that known multiplex transmission technologies such as WDM can be used for sharing an optical bus by several channels. As additional references, Tanenbaum teaches in Section 3.3 multiplexing techniques for transmission and Friend et al. teaches in page 4-9 concept and advantage of multiplexing. One of ordinary skill in the art would have been motivated to combine the teaching of Tanenbaum or Friend et al. with the transmission system of Staiger because multiplexing reduces the number of costly optical buses and reduces the space occupied by extra optical buses. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use multiplexing technique to share an optical bus among several users, as taught by Tanenbaum or Friend et al., in the transmission system of Staiger because multiplexing reduces the number of costly optical buses and reduces the space occupied by extra optical buses.

Regarding claims 9 and 17, the optical bus of Staiger is bi-directional (see col. 6, line 26) and mobile telephones support bi-direction traffic. Therefore, Staiger also teach to send signals

from the signal processing sections via the optical transmission section to radio signal transmission sections.

6. Claims 2-3, 10-11, 18-19, 21-22 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staiger, Tanenbaum and Friend et al. as applied to claims 1, 9 and 17 above, and further in view of Matsuda (U.S. Patent 5,477,363).

Staiger, Tanenbaum and Friend et al. have been discussed above in regard to claims 1, 9, 17 and 23. Regarding claims 2 and 10, Staiger teaches in col. 4, line 34-col. 6, line 4 first signal conversion device IR diode 13 for converting electric signal into optical signal and second signal conversion device photodiode 14 for converting optical signal into electric signal. The difference between Staiger, Tanenbaum and Friend et al. and the claimed invention is that the modified system of Staiger, Tanenbaum and Friend et al. directly interfaces optical transmitting device and optical receiving device to an optical bus without using optical wave guides. Matsuda teaches in col. 2, line 65-col. 3, line 24 disadvantage of diffusion type optical bus and suggests to replace it with a switching type optical bus as illustrated in FIG. 3. FIG. 3 comprises a plurality of laser diodes 33 corresponding to the claimed first signal conversion section, slab 31 corresponding to the claimed optical transmission section, diffraction grating 32 corresponding to the claimed optical bus, glass path between lasers and diffraction grating corresponding to claimed first optical wave guide, photodiode array 34 corresponding to claimed second signal conversion section and glass path between diffraction grating and photodiode array 34 corresponding to claimed second optical wave guide. One of ordinary skill in the art would have been motivated to combine the teaching of Matsuda with the modified transmission system of Staiger, Tanenbaum and Friend et al. because the optical bus of Matsuda eliminates the problem

of decreasing reception signal level associated with diffusion type bus. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the optical communication link of Matsuda in the modified transmission system of Staiger, Tanenbaum and Friend et al. because the optical bus of Matsuda eliminates the problem of decreasing reception signal level associated with diffusion type bus.

Regarding claim 18, Matsuda teaches in FIG. 12 arrangement for bi-directional communications between terminals #0-#100. Since the optical bus of Staiger is also bi-directional, the modified optical bus of Staiger and Matsuda also teaches third signal conversion device, fourth signal conversion device, third optical wave guide and fourth optical wave guide for supporting bi-directional traffic.

Regarding claims 3, 11 and 19, the structure of slab 31 of Matsuda is shaped like a sheet.

Regarding claims 21-22, Matsuda teaches in FIG. 3 that the first, second, third and fourth wave guides are form integrally as slab 31.

Regarding claims 24-27, Matsuda teaches in FIG. 3 stepwise portions that input and/or output optical signal.

7. Claims 2, 4, 7-8, 10, 12, 15-16, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staiger, Tanenbaum and Friend et al. as applied to claims 1, 9 and 17 above, and further in view of Paniccia (U.S. Patent 6,374,020 B1).

Staiger, Tanenbaum and Friend et al. have been discussed above in regard to claims 1, 9, 17 and 23. Regarding claims 2, 10 and 18, Staiger teaches in col. 4, line 34-col. 6, line 4 first signal conversion device IR diode 13 for converting electric signal into optical signal and second signal conversion device photodiode 14 for converting optical signal into electric signal. The

difference between Staiger, Tanenbaum and Friend et al. and the claimed invention is that the modified system of Staiger, Tanenbaum and Friend et al. directly interfaces optical transmitting device and optical receiving device to an optical bus without using optical wave guides. Paniccia teaches in FIG. 3 to use optical fiber for connecting devices or subsystems to an optical bus wherein the optical fibers are connected to I/O ports of the optical bus. One of ordinary skill in the art would have been motivated to combine the teaching of Paniccia with the modified transmission system of Staiger, Tanenbaum and Friend et al. because using optical fiber for connection gives flexibility to where the devices or subsystems are located and eliminates problem of alignment between the devices and optical bus. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have ports for the optical bus and use optical fiber for connecting E/O converting devices and O/E converting devices to these ports, as taught by Paniccia, in the modified transmission system of Staiger, Tanenbaum and Friend et al. because using optical fiber for connection gives flexibility to where the devices or subsystems are located and eliminates problem of alignment between the devices and optical bus.

Regarding claims 4, 12 and 20, Staiger teaches in FIG. 1 diffusion bus 7 (see col. 4, line 47).

Regarding claims 7-8 and 15-16, Paniccia teaches to use optical fiber as wave guide for connecting to optical ports of the optical bus.

8. Claims 2, 5-6, 10, 13-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staiger, Tanenbaum and Friend et al. as applied to claims 1, 9 and 17 above, and further in view of Feldman et al. (U.S. Patent 6,332,050 B1).

Staiger, Tanenbaum and Friend et al. have been discussed above in regard to claims 1, 9 and 17. Regarding claims 2 and 10, Staiger teaches in col. 4, line 34-col. 6, line 4 first signal conversion device IR diode 13 for converting electric signal into optical signal and second signal conversion device photodiode 14 for converting optical signal into electric signal. The difference between Staiger, Tanenbaum and Friend et al. and the claimed invention is that the modified system of Staiger, Tanenbaum and Friend et al. directly interfaces optical transmitting device and optical receiving device to an optical bus without using optical wave guides. Feldman et al. teaches optical slab waveguide for high speed, high capacity interconnects. In particular, Feldman et al. discloses in FIG. 9 a slab with a plurality of input ports and a plurality of output ports. Feldman et al. teaches in FIG. 7 to use lenses and grating to guide lightwave from output port 24 to detection plate 32. A similar optical arrangement can be used for input ports. One of ordinary skill in the art would have been motivated to combine the teaching of Feldman et al. with the modified transmission system of Staiger, Tanenbaum and Friend et al. because the slab waveguide of Feldman et al. supports high speed and large capacity. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a slab waveguide as an optical signal transmission section, as taught by Feldman et al., in the modified transmission system of Staiger, Tanenbaum and Friend et al. because the slab waveguide of Feldman et al. supports high speed and large capacity.

Regarding claims 5-6 and 13-14, Feldman et al. teaches in FIG. 7 that I/O port 24, and grating 28 are designed to reflect optical signal to/from the optical slab.

Regarding claim 18, since the optical bus of Staiger is bi-directional, Staiger also teach third signal conversion device and fourth signal conversion device for supporting bi-directional

traffic. It would also have been obvious to one of ordinary skill in the art to use third optical wave guide and fourth optical wave guide for connecting the third conversion device and fourth conversion device to the optical bus as taught by Feldman et al. in FIG. 7.

***Response to Arguments***

9. Applicant's arguments with respect to claims 1-22 and 24-27 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl
27 September 2005

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Jk 9/27/05



FIG.1

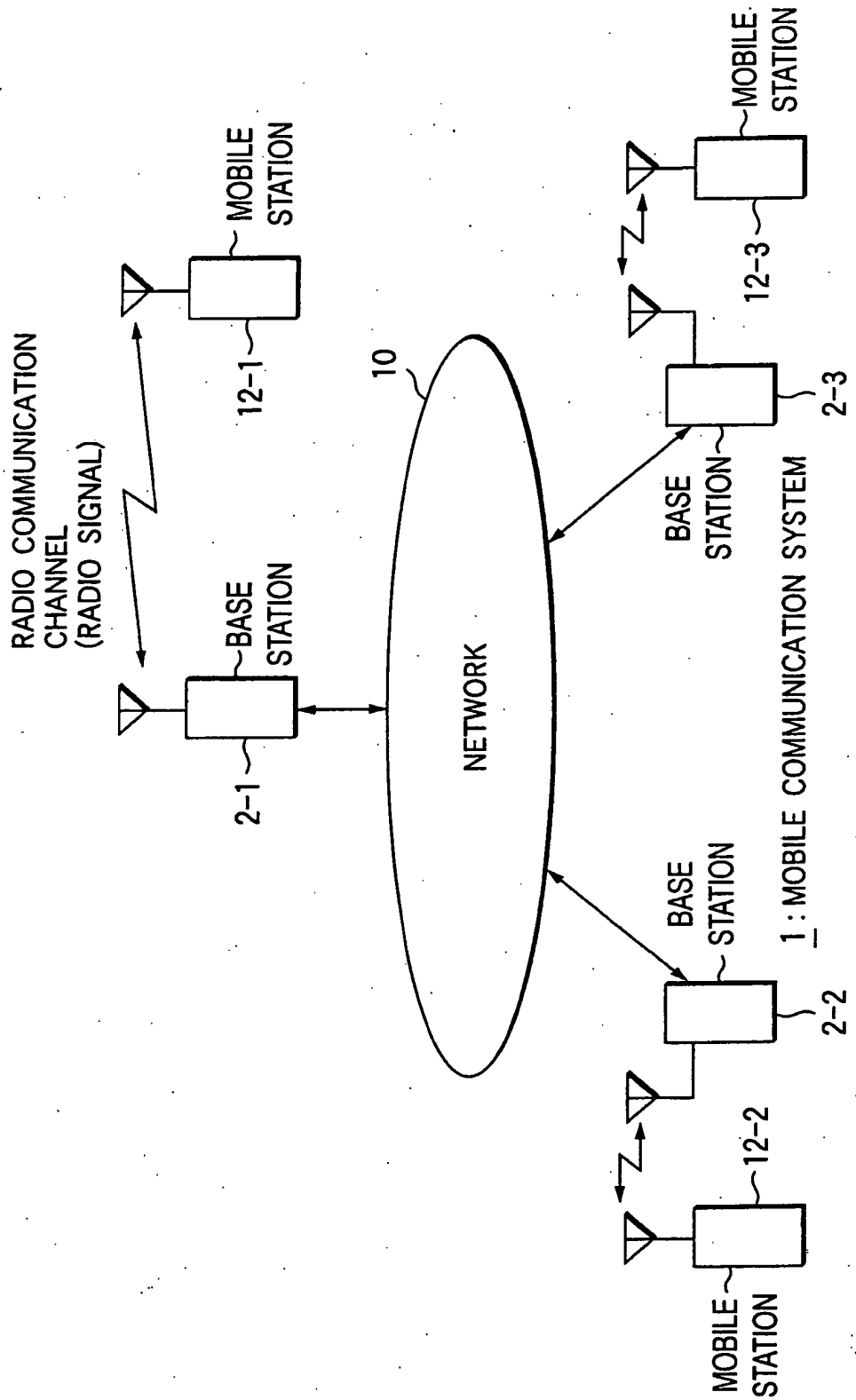
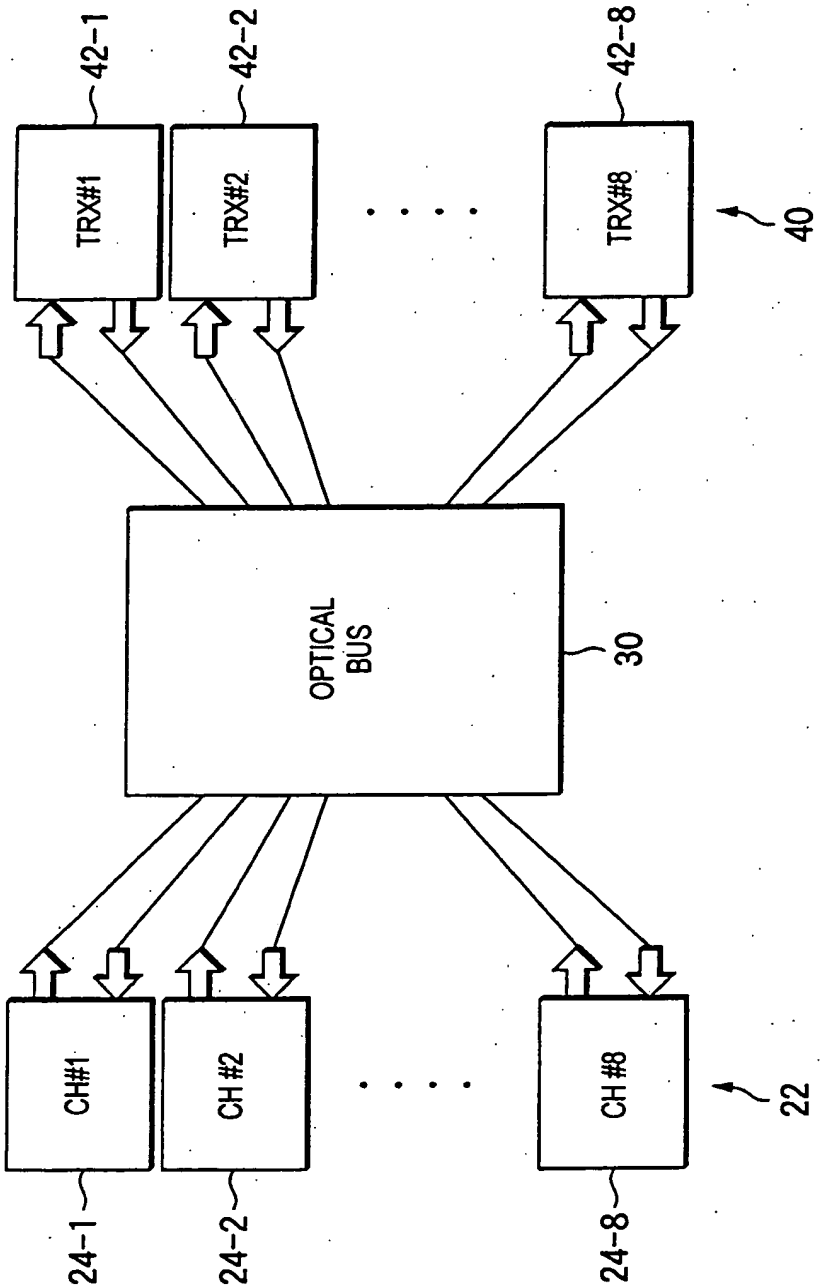


FIG.3


42-1
42-2
42-8
TRX#1
TRX#2
TRX#8
40
OPTICAL BUS
30
CH#1
CH #2
CH #8
22
24-1
24-2
24-8